

## **ACCESSORY MOUNTING SYSTEM**

### **BACKGROUND OF THE INVENTION**

**[0001]** The present invention relates generally to motorcycle accessories and more particularly to a novel mounting system for windshields and other accessories. The invention particularly relates to a novel mounting system which is not only the ultimate in simplicity, but very effective in rapidly and easily mounting and dismounting motorcycle windshields and other accessories from the cycle.

**[0002]** Although there are many different mounting systems for motorcycle windshields and the like, it would be particularly advantageous to provide such a system wherein the shield may be reliably attached to and removed from the motorcycle in a matter of seconds. This would be particularly true wherein the mounting system could comprise four docking points permanently affixed to the cycle, but would not leave unsightly or bulky fastening means on the cycle when it is desired to use the cycle without the shield or other accessory.

**[0003]** When it comes time to mount or affix the accessory, this can be done in a minute or less by a person having almost no mechanical skill. For example, it would be highly desirable to provide an accessory for mounting windshields or other accessories, wherein the docking points could be affixed to the motorcycle and remain there permanently, while the shield itself and the two brackets for mounting it could be removed and stored as a unit without further disassembly. Particularly, it would be desirable if there were such a system wherein the docking points used to mount the shield could be affixed to the motorcycle and thereafter be allowed to remain there without distracting from the appearance or function thereof, and without presenting any ungainly elements or the like such as protruding screws, studs, brackets or braces. It would also be advantageous if a simple mounting system could be placed relatively permanently on the cycle which would enable the shield to be mounted by placing it downwardly on a pivot

point and thereafter merely snapping it into place by a backward (in relation to the cycle) motion into a secured position.

**[0004]** It would also be desirable to make a shield which would be able to be removed by a much less strong, forwardly acting force, such as from the force of a rider being thrown forward in the event of an accident, whereby the shield would be detached rather than remaining in place and injuring the rider.

**[0005]** It would also be an advantage to provide such a system with a pair of clamps surrounding each fork tube which would be tightened merely by completing the installation of the mounting system, and not requiring additional tools to install the system. Such a system would not require any post-installation adjustment.

**[0006]** Accordingly, it is an object of the present invention to provide an improved mounting system for a windshield or the like.

**[0007]** Another object is to provide a unique mounting system wherein the mounting bracket on the shield includes a very small but definite projection or bump in the lower surface of the upper mounting slot to facilitate ready installation and latching.

**[0008]** A still further object of the invention is to provide a system which uses metal straps similar to hose clamps or the like enabling a bracket holder to be mounted on the fork legs or the fork leg housing of the motorcycle.

**[0009]** Another object is to provide a mounting system adaptable to different sizes of mounting, merely by changing the straps which secure the bracket holders to the fork legs or the fork leg covers.

**[00010]** Another object is to provide a novel flanged mounting wheel, a urethane or other elastomeric or flexible middle section, an outer flanged section and optimally having a thin, hollow innermost sleeve, making a unique composite mounting wheel capable not only of rotating to ease

installation but also allowing a limited amount of radial deflection as it is being installed.

**[00011]** A still further object is to provide a system which in one embodiment, includes a pair of straps, a mounting bracket holder including studs, a bracket cover unit and two shield or like accessory mounting wheels, each secured to the bracket holder by threaded fasteners.

**[00012]** A further object is to provide a mounting system for other accessories which would use the same or similar arrangement of bracket for mounting saddlebags or other accessories.

**[00013]** A still further object of the invention is to provide a simplified system of mounting and dismounting the desired accessory.

**[00014]** Another object is to provide a contoured cover for the straps surrounding the fork tubes securing the bracket holder to the tubes, whereby a finished appearance is maintained in the cycle.

**[00015]** A still further object is to provide a mounting system that is virtually foolproof in operation.

**[00016]** These and other objects of the invention are achieved in practice by providing, in one embodiment, a novel strap and mounting system for a specially designed accessory mounting bracket, said system including a pair of studs and a pair of flanged wheels or rollers, one of which may remain on a fixed axis but is rotatable and other which is not only rotatable but also able to undergo slight radial deformation or deflection under an applied load. The other embodiment does not use straps, but mounts the docking points directly on the fork tube covers. Reduction of sliding forces friction rotation.

**[00017]** The manner in which these and other objects and advantages are achieved in practice will become more apparent when considered in connection with the following description of the preferred embodiments of

the invention and shown in the accompanying drawings, wherein like reference numbers indicate corresponding parts throughout.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

**[00018]** Fig. 1 is a rear perspective view showing a part of the windshield, the brackets and the bracket mounting means fitting over the fork tubes;

**[00019]** Fig. 2 is an exploded view showing the fork tubes, a pair of straps, a mounting bracket holder, a holder cover, a three piece flanged wheel and a mounting fastener, as well as one of the shield mounting brackets;

**[00020]** Fig. 3 is a side elevational view of the elements of the mounting system of the invention including the mounting bracket and the flanged wheels of the invention;

**[00021]** Fig. 4 is an enlarged fragmentary view of a portion of the mounting bracket and the upper flanged wheel;

**[00022]** Fig. 5 is a further enlarged vertical sectional view of the upper flanged wheel shown in Figs. 3 and 4, and showing the wheel in its fully installed position within the windshield;

**[00023]** Fig. 6 is a front elevational view of the upper flanged wheel of Fig. 5;

**[00024]** Fig. 7 is a fragmentary view of another form of mounting system for the shield, wherein the fasteners mounting the flanged wheels pass through an opening in the fork covers and are bolted directly into the triple clamps of the cycle; and

**[00025]** Fig. 7A is an exploded view of the upper mounting wheel, the fastener, the fork cover, and showing a tapped opening in the triple clamp holding the fork leg.

## **DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION**

**[00026]** While the invention may be practiced in different ways and there will be room for modifications to be made by those skilled in the art, a brief description will be made of several preferred embodiments of the invention.

**[00027]** Referring now to the drawings in greater detail, there is shown a windshield generally designated 10 and shown to be affixed to a front portion of a motorcycle fork tube generally designated 12 in FIGS. 1 and 2. These views show the windshield generally designated 10, a windshield stiffener 14 and one fork leg 16 shown fragmentarily in FIG. 2; the front end structure of the cycle includes a second identical leg (not shown) arranged to form part of the so-called triple clamp of the motorcycle as is known to those skilled in the art. A pair of straps generally designated 18, 20 are shown, and each of these has a body portion 22, 24, pairs of openings 26, 28, 30, 32 for engaging pairs of upper ears 33 and lower ears 34 of the attachment backbone 36. The backbone 36 has welded to it an upper stud 38 and a lower stud 40. The backbone 36 is then secured to the fork tubes by means of placing the ears 33, 34 through the openings 26, 28, 30, 32 in the straps 22, 24. The straps 22, 24 will then be tightened as will be described later.

**[00028]** The backbone cover, generally designated 42, is then fit over the pair of studs 38, 40. Referring again to the backbone cover 42, the circular openings 44, 46 therein accommodate the studs 38, 40, and these openings 44, 46 are surrounded by flattened, circular areas 48, 50. The lower stud 40 extends through the lower opening 46 and receives a lower flanged wheel generally designated 52 and an internally threaded fastener, generally designated 56, which has a head portion 62 and a hexagonal opening 64 for receiving an allen wrench in the head portion 62. It also has an extended shank portion 66 for purposes which will be described. The small lower wheel 52 also includes a center trough 55 and flanges 57, 59 to either side thereof.

**[00029]** The lower flanged wheel 52 has a central opening 68 for passage of the shank 66 therethrough so that the shank can rest on, and caused to be exerted an axial compressive force on the circular area 50 of the backbone cover 42. The lower wheel 52 is therefore firmly mounted for rotation about the shank 66 of the nut 62.

**[00030]** The upper stud 38 passes through the opening 44 and extends into a multi-piece top flanged wheel assembly generally designated 70. The stud 38 is surrounded by a steel sleeve 76 having a central opening 74 therein. The sleeve 76 fits snugly on the inside diameter 78 of a urethane or like rubberized bushing generally designated 80, leaving the outside diameter 82 of the urethane bushing to fit snugly into the inside diameter 84 of the upper flanged wheel generally designated 70. The outside diameter of the upper flanged wheel 70 includes a center trough 90 flanked by two flanges 92, 94.

**[00031]** A fastener generally designated 100 includes a hexagonal opening 102 for an allen wrench or like tool (not shown), in an enlarged head 104 and a reduced diameter shank portion 106 which is sized to fit exactly through the inside diameter 74 of the sleeve 76. The shank 106 bears on the circular area 48 of the backbone cover 42 so the stud can pull the straps 22, 24 tight by pulling the cover against the straps 22, 24 and thus pulling the straps 22, 24 against the fork tube 12.

**[00032]** The upper and lower wheels 70, 52 and the various parts used to position them are all collectively referred to as "docking points", since the windshield fastens to them. It will thus be seen that when the docking points are affixed to the cycle, the only visible portions of these parts of the system are the wheels 52, 70, their needed fasteners 56, 100, and the clamps 18, 20, whose ends are shrouded by the cover 42. The two wheels and their fasteners are very smooth and streamlined, thus present an inconspicuous but finished appearance to the motorcycle.

**[00033]** The sleeve 76, urethane bushing 80 and flanged wheel 86 are formed as an integrated unit in one embodiment, with the urethane being

optionally bonded to both the sleeve 76 and the flanged wheel 70, the inside and outside diameters 78, 82 of the urethane bushing being the affected parts. In the alternative, the bushing 76 may be press fit into the urethane 80 which is fastened to the wheel 70.

**[00034]** Referring now to Figs. 3-6, there is shown a windshield mounting bracket generally designated 110 and shown to include a main body portion 112, and a plurality of ears 114, 116 and 118, one of which may also be attached to the stiffener 14. In addition, and very importantly, the bracket 110 (whose mirror image is on the other side of the windshield assembly) has a generally upwardly extending slot generally designated 120 near the bottom of the bracket 112, and an upper, generally horizontally extending slot generally designated 124. The nearly horizontal slot 124 is defined by an upper, slightly arcuate line segment 126 and a lower slightly arcuate line segment 128 with the two segments being substantially parallel to each other. The two segments are joined by a circular arcuate surface 129, and importantly, by a very small projection or bump 130. The bump 130 keeps the upper wheel in contact with the circular arcuate surface 129, and provides resistance to escape of the wheel 86 once it is in place. The bump 130, although small, also provides substantial resistance during positioning the shield when it is being installed. As can be seen, the arcuate surfaces 126, 128 have a radius approximately equal to the imaginary radius line 122.

**[00035]** An important feature of the invention is the manner in which the urethane elastomer or other flexible part of the flanged wheel undergoes deflection in response to contracting the bump 130. This is a seating force, measured at the top of the windshield of about 30-35 pounds. Once seated, the windshield resists a rearward deflection of a much greater force. It will release at about 30-35 pounds of forward force, thus constituting a safety feature.

**[00036]** Referring now to Figs. 7-7A, there is shown an embodiment in which, rather than having a stud protrude from the fork legs, and mounting

the docking points, the docking points are attached directly to the fork tube cover 140 and also to the triple clamp 142 holding the fork tubes 144.

**[00037]** The headed fasteners 146 pass through the flanged wheel 148 and the fasteners contain a shank 150 with very fine threads 152. The triple clamps 142 have openings 154 which are tapped as at 156 to receive the shanks 150 of the fasteners 146. For this reason, the fork tube covers 140 have openings therein. Therefore, the fork covers 140 are held in place between the wheels 148 and the triple clamps 142. The wheels 148 have the urethane flexible annular intermediate section 158 and optionally, the sleeve 160. The lower wheel 162 attaches in a similar manner.

**[00038]** As in the other embodiments, a sleeve 160 may slide into the flexible annular intermediate section 158 of each wheel 148 with a press fit, or may be bonded thereto. The flexible, annular intermediate section 158 may in turn be bonded to the inside diameter 164 of the wheel 148. In this arrangement, the wheels 148, 162 may be spaced somewhat farther apart, perhaps as much as 8-10 inches, than their counterparts in the earlier example.

**[00039]** The shield is affixed to brackets in the same way, and is installed in the same way.

**[00040]** Referring now to another variation or embodiment of the invention, accessories of another kind, such as saddlebags, for example, may be mounted and dismounted with equal ease in this way. In this case, the bracket mounting the saddlebags is disposed in a generally horizontal plane. One would use the two docking points on either side of the apparatus, with the docking points being affixed directly to a fender brace, for example. Thereupon, the two docking points being spaced apart, one would cause the smaller wheels to enter the smaller, horizontal slot, whereas the other or larger docking point would engage the generally vertical slot. With the apparatus then pushed downwardly, the apparatus would be in snug condition. The lifting force required to remove the apparatus would normally be of the same order as in the other case, say 30



to 40 pounds. If an additional fastening apparatus is needed, for example, a claw-type unit such as disclosed in U.S. Patent No. 6,484,914 could be used. However, the convenience of using this type of apparatus for moderate applications would more than justify its use. The ease of applying the accessory is accounted for by the fact that the larger wheels are rotatable and somewhat elastic in their mid-section, and yet retain there integrity. The smaller wheels are desirably also rotatable, but the smaller wheel need not, strictly speaking, be rotatable.

**[00041]** It is important that the shield provides security against inertial forces resulting from road shock, etc. By placing the slots in the position shown, the jarring of the cycle owing to irregularities in the road, etc., are generally vertical, and are resisted by the solid portion of the bracket. The shield is preferably installed at a ten to twenty degree inclination from the vertical, although this is not strictly necessary.

**[00042]** It is possible for something other than an elastomer to be used as the core of the wheel. Thus, a series of inclined spokes or the like could be placed in the core of the wheel, or a sinuous spring, for example, a garter spring that is inclined somewhat so as to deflect a small amount on the application of a force could also be used. The stiffness of the elastomer should be taken into account with a durometer of 70 to 95, with 90 being preferred. Other variations will occur to those skilled in the art and such may be made without departing from the spirit of the invention or the scope of the appended claims.